

# ABSTRACT

An improved heat shield offers thermal insulation and reduced noise transmission for vehicular engine components, including exhaust manifolds. The structure has three layers: an outer structural metal layer, a center insulation layer to isolate heat and dampen noise, and an inner metal layer directly adjacent the shielded component for reflecting heat back to the shielded component. As disclosed, the shield has at least one edge portion defined by outwardly flared undulations or waves. The waved edge minimizes impact of plastic deformation of the metal edges during manufacture of the shield, which tends to produce wrinkling at the edges, and creates undesirable stiffness. Finally, the edge boundary of the outer metal heat shield layer is folded over the edges of the insulation and inner metal layers to avoid any sharp edges, thus preventing injury to installers and reinforcing the heat shield structure to enhance useful life under vibration and heat conditions.

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